Combined Heat and Power - Recycled Energy

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Overview

- What is the EPA CHP Partnership?
- What is CHP?
- Why CHP?
- Opportunities in Wisconsin
- EPA/DOE activities to advance CHP
- Opportunities for Partnership

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EPA's CHP Partnership (CHPP)

- Voluntary public-private partnership launched in 2001
  - To reduce green house gas emissions from power generation by fostering the use of CHP
  - 124 Partners to date
    - States, energy users, developers, equipment manufacturers, utilities, energy service companies, NGOs
    - Wisconsin DOA Energy Office and other MW states
    - Key agencies: US DOE, FEMP, HUD, USCHPA
  - Assisted 65 operational projects totaling over 850 MW)

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What Does the CHPP Do?

- Help Partners implement CHP projects
  - Targeted market development
  - Networking
  - Project tools & support
- Work with States to promote the environmental, economic, and energy benefits of CHP
- Work with DOE, USCHPA, Regional CHP Initiatives, DOE's CHP Application Centers, and State agencies to jointly implement efforts
- Recognize environmental excellence of CHP projects and Partners' efforts

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Why Combined Heat and Power?

- Smart on-site energy supply option
  - Simultaneous generation of power and heat with primary and recycled energy
- Reduces emissions
  - More efficient than grid power and on-site thermal
- Saves money
  - Efficiency reduces fuel demand and energy costs
- Can improve power infrastructure
  - CHP may supplement the grid

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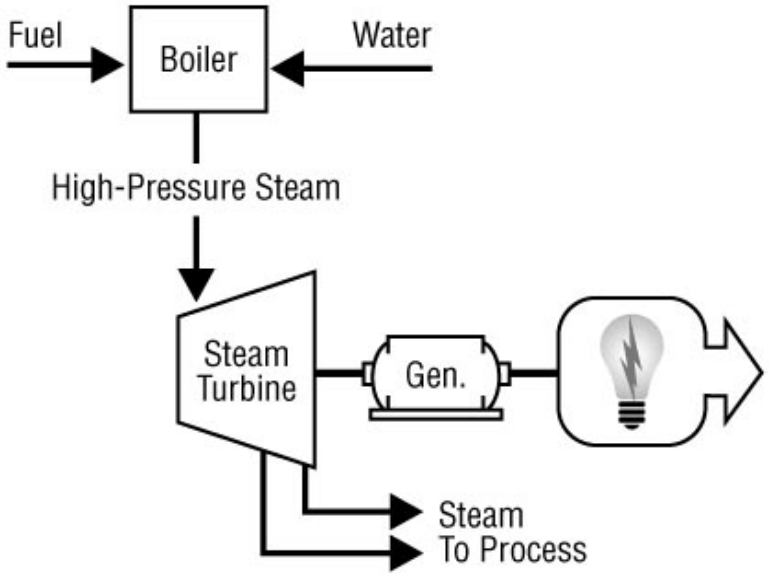
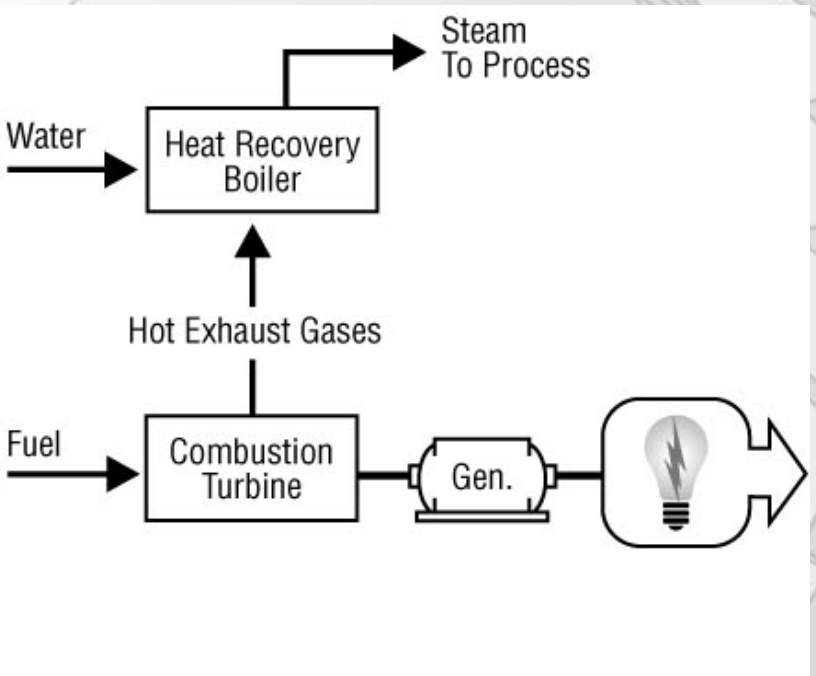
Typical CHP Systems

Steam Boiler/Steam Turbine:



Gas Turbine /Heat Recovery Unit:



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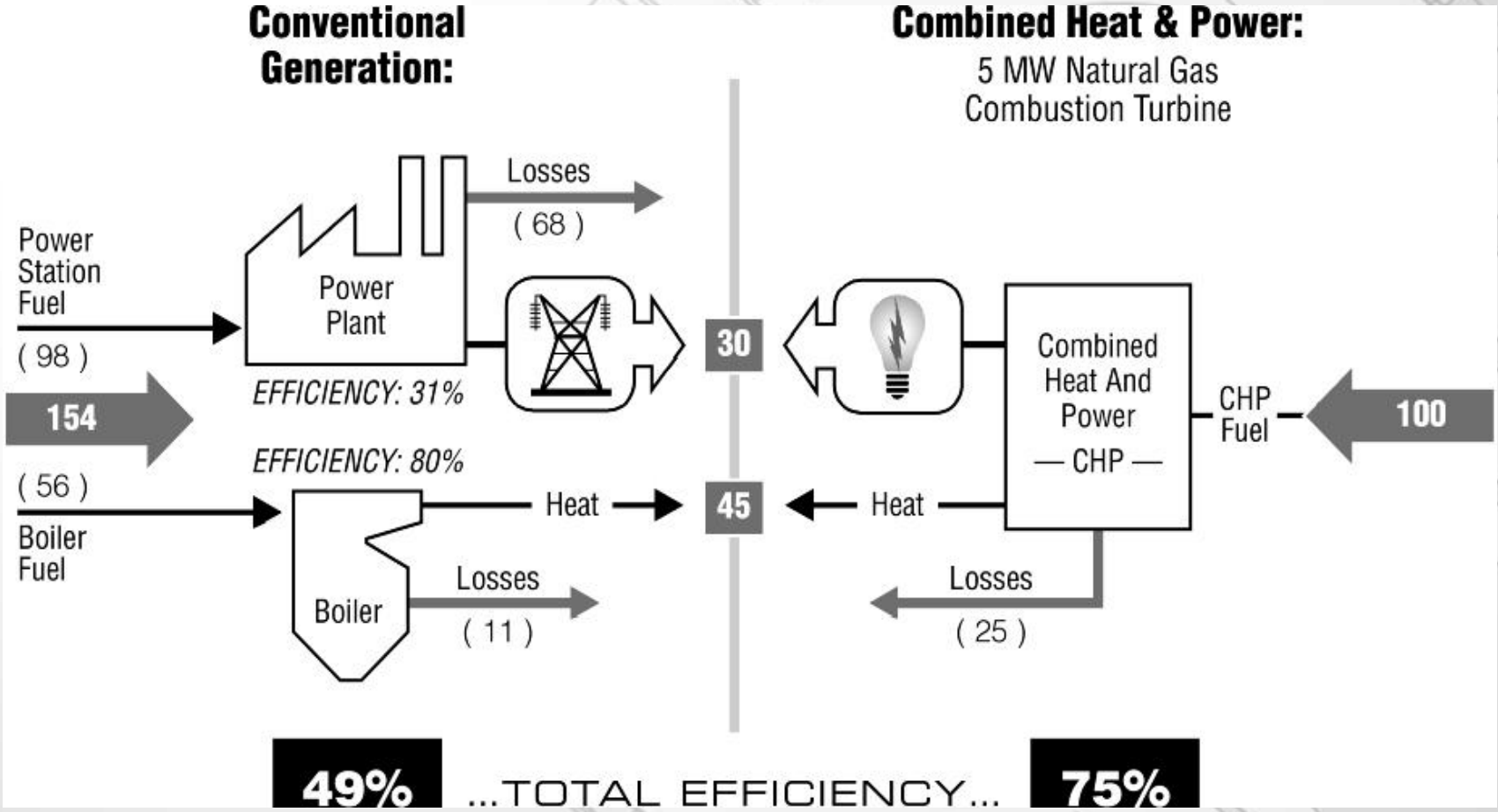
Efficiency Benefits of CHP



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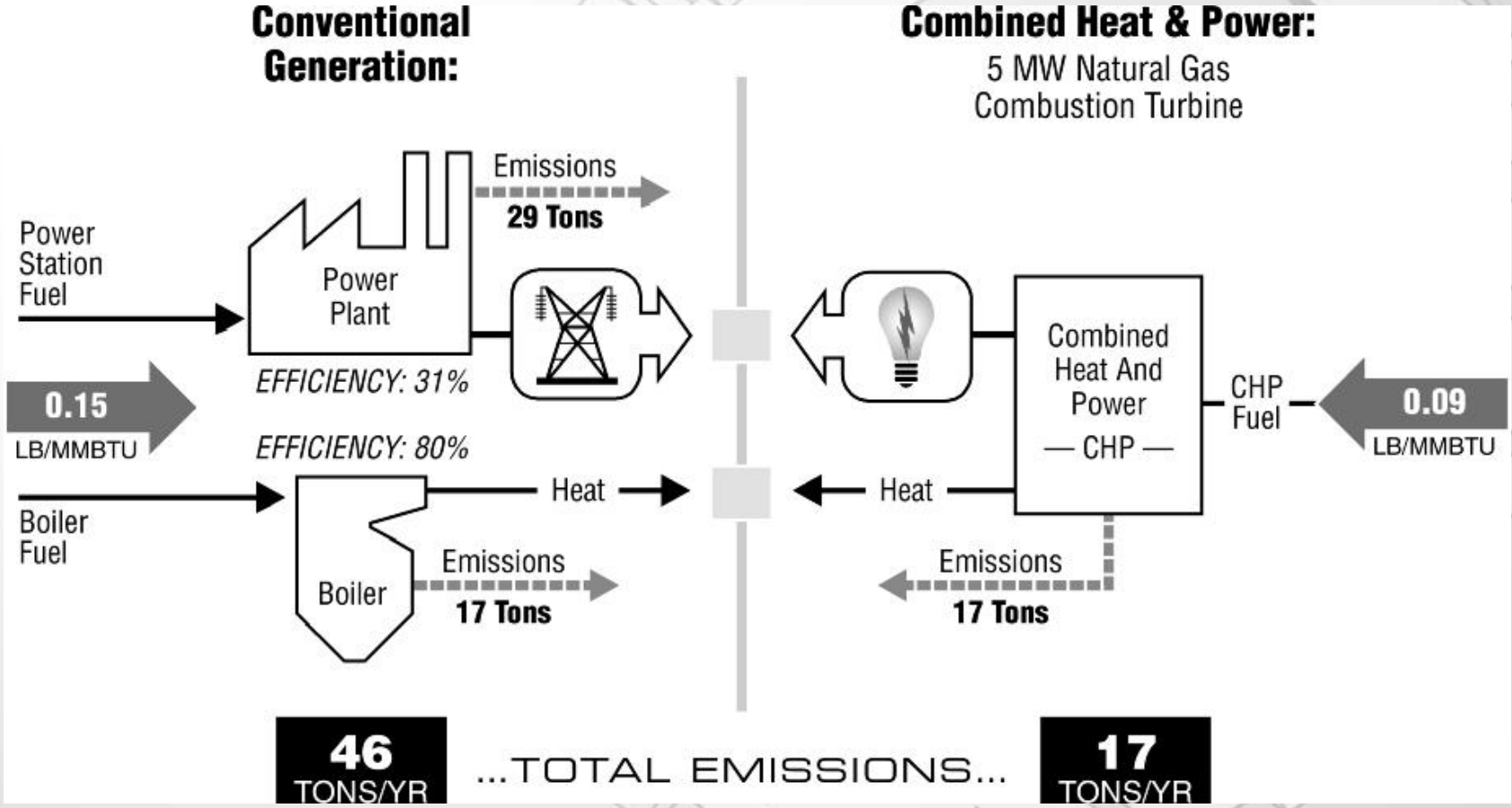
Environmental Benefits of CHP



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CHP Opportunities in Wisconsin

- EPA has identified key markets – Wisconsin is a lead state for both
  - Ethanol
  - Dairy
- DOE's Midwest CHP Application Center efforts
  - Baseline Study
  - CHP Hospital Program
  - City of Milwaukee Outreach
- Wisconsin DOA active in identifying other CHP opportunities
  - Cyclone boilers
- WI CHP Potential 1300-2600 MWs

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Drivers in Wisconsin

- Wisconsin energy infrastructure in need of major development
  - Power costs increasing
  - Need for 8000 MWs of new power generation
  - Need for $2 billion of upgrades to T&D system
- Wisconsin DG interconnection guidelines can streamline implementation of projects
- CHP and recycled energy can be part of an environmentally friendly solution to Wisconsin's power needs

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Challenges to Implementing CHP

- Unfamiliarity with technologies
- Lack of capital
- Other pressing priorities
- Concern about natural gas prices
- Utility practices (e.g., interconnection requirements)
- Questions about permitting

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EPA and DOE Are Helping Advance CHP in the Midwest

- Evaluated environmental, economic, and energy benefits of CHP
- Developing educational materials
- Holding workshops (e.g., Iowa workshop for ethanol industry in Spring 2004, with MW Application Center)
- Visiting and networking with plants, developers, and other key players
  - e.g., ethanol industry

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How Can Wisconsin Benefit?

- Work with the EPA Partnership to explore and promote CHP opportunities in the state
  - Identify DNR CHP permitting liaison
  - Identify ways to expedite the permitting process
  - Adopt emissions limits on an output basis to account for the efficiency of CHP
- Identify opportunities for public service commission to establish rules for fairer treatment of CHP by utilities
- Explore tax credits for CHP Installations
- Consider a goal for CHP(10-15% of new generation)

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What Are Other States Doing?

- Setting uniform interconnection standards for DG/CHP (Wisconsin one of Energy Leaders)
- Reviewing standby and back-up rates
  - Eliminating in some States
- Expediting permitting for CHP projects
- Recognizing environmental benefits of CHP
  - Considering for RPS or CHP/ Recycled Energy Goals
  - Establishing output-based emissions limits
- Incentive programs
  - Technology Implementation – Turbines & Recips
  - Technology Demonstration – Microturbines, and Fuel Cells
  - CHP gas rates

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What is Output-Based Regulation?

- Regulation that relates emissions to the productive output of a device or process
  - Unit of emissions/unit of output
  - lb emission/MWh
- Can be applied for any process

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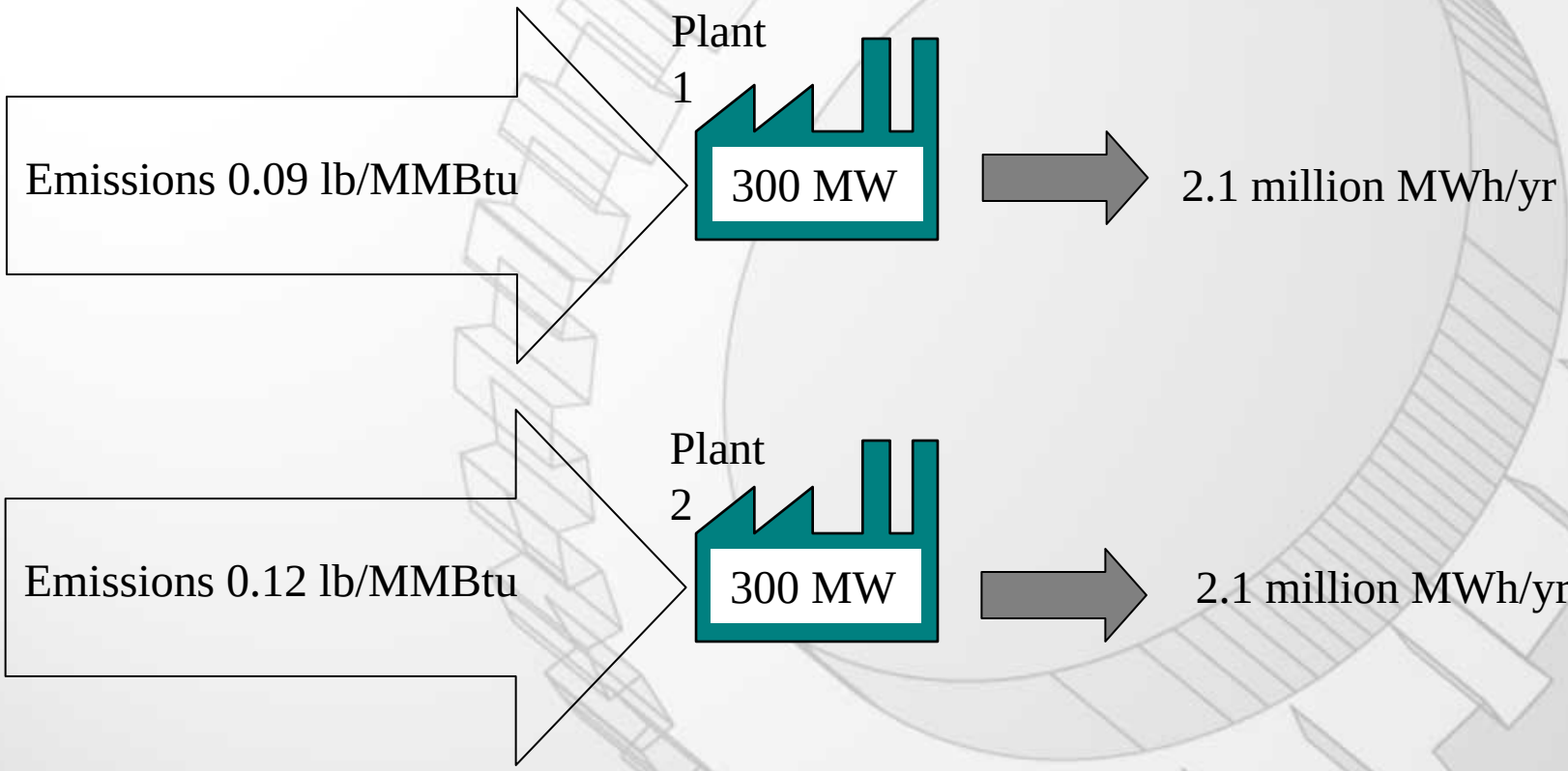
Benefits of Output-Based Regulation



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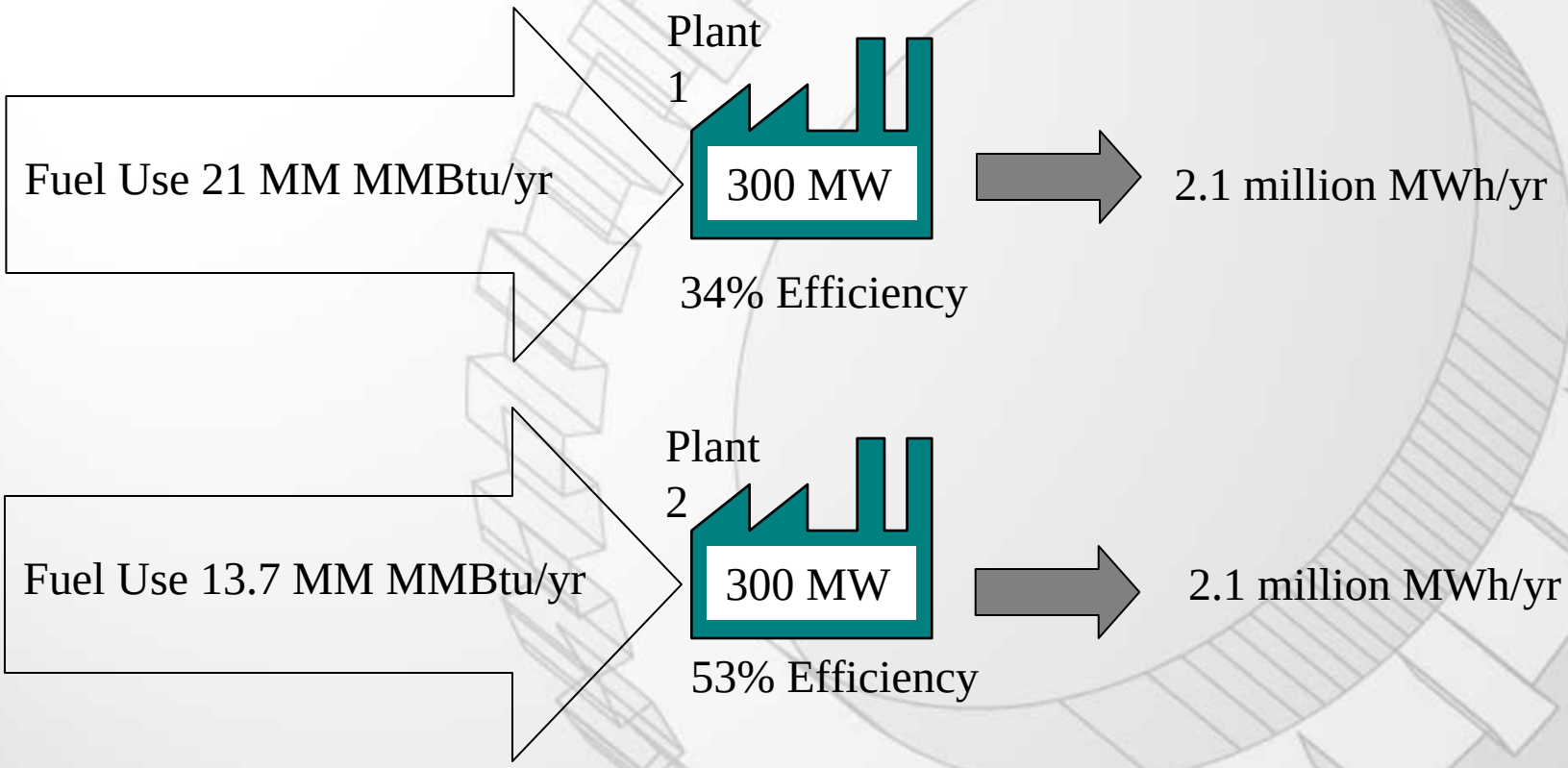

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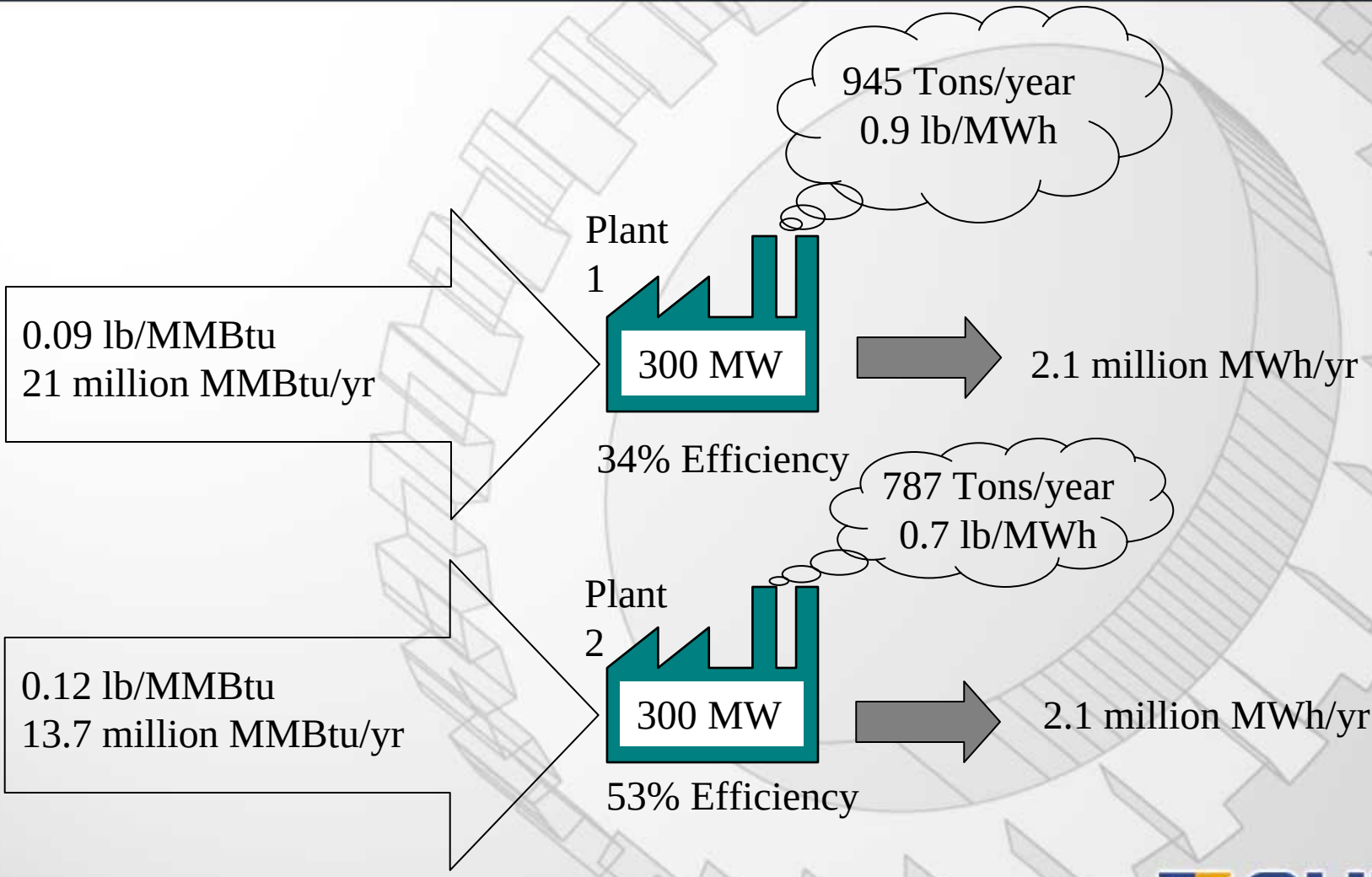

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Conclusions

- CHP is technically feasible for many industries and businesses in Wisconsin
- CHP can benefit the consumer, the State, and the environment
  - emissions reductions/replacement of older assets
  - energy savings/alternative fuels
  - power infrastructure
- Support network in place to help implement CHP
  - EPA's CHPP
  - DOE's Midwest CHP Application Center and Initiative
- States can take the lead in improving the efficiency and emissions profile of the power supply sector

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Resources Available

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